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10/688,471	10/16/2003	Xing Xie	MS1-1643US	3070

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EXAMINER	
DALEY, CLIFTON G	

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/688,471	XIE ET AL.	
	Examiner	Art Unit	
	CLIFTON G. DALEY	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 January 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4, 6-14, 16-18, 20-30 and 32-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *41* is/are allowed.

6)☒ Claim(s) *1-4,6-11,14,16-18,20-22,27-30,32-34 and 40* is/are rejected.

7)☒ Claim(s) *12,13,23-26 and 35-38* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 January 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/18/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings were received on 1/18/2008. These drawings are acceptable.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-4, 7-10, 16-18, 20-21, 28-30, 32-33 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horvitz et al. (Hereinafter "Horvitz": US 6232974) in view of Itti et al. (Hereinafter "Itti": L. Itti, and C. Koch, "Computational Modelling of Visual Attention", Nature Reviews/Neuroscience, Vol. 2, March 2001, pp 1-11), and further in view of Slatter (US 7248294).

Regarding **claim 1**, Horvitz teaches a method comprising:

modeling an image with respect to multiple visual attentions to generate a respective set of attention objects (AOs) for each attention of the visual attentions (Fig. 8 and column 7, lines 12-20); and

analyzing the attention objects and corresponding attributes to optimize a rate of information gain as a function of information unit cost in terms of time (column 6, lines 30-46) associated with multiple image browsing modes (column 14, lines 63-67), wherein the corresponding attributes for each attention object of the AOs comprise a

minimal perceptible time (MPT) for display of subject matter associated with the attention object (column 17, lines 65-67 and column 18, lines 1-2).

Horvitz does not teach, responsive to analyzing the attention objects, generating a browsing path to select ones of the attention objects.

However, Itti discloses a method of, responsive to analyzing the attention objects, generating a browsing path (i.e. scanpath) to select ones of the attention objects (page 3, left column, lines 2-8).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined Itti's method with Horvitz's teaching, the motivation to combine being to enhance understanding of a visual scene (Itti: page 2, left column, lines 6-9).

Horvitz combined with Itti does not teach the limitation of causing display of subject matter associated with each of the selected ones of the attention objects for at least a respective minimal perceptible time by panning the image according to the generated browsing path.

However, Slatter discloses an imaging system wherein subject matter associated with each of the selected ones of the attention objects (column 2, lines 7-14, i.e. faces) for at least a respective minimal perceptible time (i.e. time required for faces to be clearly seen) by panning the image (column 3, lines 8-13).

It would be obvious to one of ordinary skill in the art at the time of the invention to combine Slatter's panning method with the Horvitz/Itti browsing system in order to

clearly see picture details when a picture is too large for the display device (Slatter: (column 1, lines 13-21).

Regarding **claim 2**, Horvitz in combination with Itti and Slatter teaches a method as recited in claim 1, wherein the multiple visual attentions are based on saliency (Horvitz: column 24, line 22), face (Itti: page 8, right column, line 9), and text (Itti: page 7, right column, line 25-26, i.e. recognition of words) attention models.

Regarding **claim 3**, Horvitz in combination with Itti and Slatter teaches a method as recited in claim 1, wherein the image browsing modes comprise a perusing mode (Horvitz: column 14, lines 66-67, i.e. selectively attending) and a skimming (Horvitz: column 14, lines 63-66, i.e. scalar model) mode.

Regarding **claim 4**, Horvitz in combination with Itti and Slatter teaches a method as recited in claim 1, wherein the select ones have relatively greater information fidelity as compared to different ones of the attention objects (Horvitz: Fig. 11).

Regarding **claim 7**, Horvitz in combination with Itti and Slatter teaches a method as recited in claim 1, wherein modeling further comprises: creating a visual attention model for the image, the visual attention model being generated according to

$\{AO_i\} = \{(ROI_i, AV_i, MPS_i, MPT_i)\}$, $1 \leq i \leq N$ (Horvitz: Fig. 1, 14a, 16a, 18a, to 14c, 16c, 18c); and, wherein AO_i, represents an i^{th} AO within the image (Horvitz: column 9, lines 58-60, i.e. component), ROI_i represents a region-of-interest of AO_i (Horvitz: column 7, line 17, i.e. geometric level of detail), AV_i represents an attention value of AO_i (Horvitz: column 6, line 31, i.e. expected perceptual cost), MPS_i represents

a minimal perceptible size of AO_i (Horvitz: column 7, line 17, i.e. spatial resolution), MPT_i represents a minimal perceptual time for display of subject matter associated with the AO_i (Horvitz: column 17, line 66), and, N represents a total number of AOs modeled from the image.

Regarding **claim 8**, Horvitz in combination with Itti teaches a method as recited in claim 1, wherein the browsing path comprises a number of successive path segments described as follows: $P = \{P_i\} = \{(SP_i, EP_i, SR_i ER_i, T_i)\}$, $1 \leq i \leq N$, and wherein P_i represents an i^{th} path segment, SP_i represents a starting point of P_i, EP_i corresponds to an ending point of P_i, SR_i is a starting resolution of P_i, ER_i is an ending resolution of P_i and T_i is a time cost for scrolling from SP_i to Ep_i (Horvitz: column 7, lines 15-19, i.e. spatial resolution. The examiner notes that a starting point, end point and a time cost for scrolling are inherent properties of a browsing path segment).

Regarding **claim 9**, Horvitz in combination with Itti and Slatter teach a method as recited in claim 1, wherein generating the browsing path further comprises creating the browsing path as a function of a fixation state (Horvitz: column 14, line 67, i.e. attending to a specific component) or a shifting state (Horvitz: column 14, lines 64-66, i.e. scalar model).

Regarding **claim 10**, Horvitz in combination with Itti and Slatter teach a method as recited in claim 1, wherein generating the browsing path further comprises calculating an information fidelity for each AO, the information fidelity being a function of an attention value (AV) and the minimal perceptible time (MPT) for display of subject

matter associated with the AO (Horvitz: column 7, lines 38-43, i.e. cost-benefit analysis for temporal resolution).

Regarding **claims 16**, Horvitz in combination with Itti and Slatter discloses a computer-readable medium (Horvitz: Fig. 13, Hard Drive 327) comprising computer-program instructions executable by a processor for executing the methods as recited in claims 1 and 9 above.

Regarding **claim 17**, Horvitz in combination with Itti and Slatter discloses a computer-readable medium as recited in claim 16, wherein the multiple visual attentions are based on saliency, face, and text attention models (as recited in claim 2 above).

Regarding **claim 18**, Horvitz in combination with Itti and Slatter discloses a computer-readable medium as recited in claim 16, wherein the select ones have relatively greater information fidelity as compared to different ones of the attention objects (as recited in claim 4 above).

Regarding **claim 20**, Horvitz in combination with Itti and Slatter discloses a computer-readable medium as recited in claim 16, wherein the computer-program instructions further comprise instructions for generating the browsing path as a number of successive path segments as recited in claim 8 above.

Regarding **claim 21**, Horvitz in combination with Itti and Slatter discloses a computer-readable medium as recited in claim 16, wherein the computer-program for generating the browsing path further comprise instructions for calculating an

information fidelity for each AO, the information fidelity being a function of an attention value (AV) and the minimal perceptible time (MPT) for display of subject matter associated with the AO (as recited in claim 10 above).

Regarding **claim 28**, Horvitz in combination with Itti and Slatter discloses a computing device comprising a processor coupled to a memory, the memory comprising computer-program instructions executable by the processor (Horvitz: Fig. 3 Personal computer 320) for executing the methods as recited in claims 1 and 9 above.

Regarding **claim 29**, Horvitz in combination with Itti and Slatter discloses a computing device as recited in claim 28, wherein the multiple visual attentions are based on saliency, face, and text attention models (as recited in claim 2 above).

Regarding **claim 30**, Horvitz in combination with Itti and Slatter discloses a computing device as recited in claim 28, wherein the select ones have relatively greater information fidelity as compared to different ones of the attention objects (as recited in claim 4 above).

Regarding **claim 32**, Horvitz in combination with Itti and Slatter discloses a computing device as recited in claim 28, wherein the computer-program instructions further comprise instructions for generating the browsing path as a number of successive path segments as recited in claim 8 above.

Regarding **claim 33**, Horvitz in combination with Itti and Slatter discloses a computing device as recited in claim 28, wherein the computer-program for generating the browsing path further comprise instructions for calculating an information fidelity for

each AO, the information fidelity being a function of an attention value (AV) and the minimal perceptible time (MPT) for display of subject matter associated with the AO (as recited in claim 10 above).

Regarding **claim 40**, Horvitz, in combination with Itti and Slatter discloses a computing device (Horvitz: Fig. 3 Personal computer 320) comprising the recited means.

4. Claims 6, 14, 27 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horvitz combined with Itti and Slatter as applied to claim 1 above, and further in view of Boguraev et al. (Hereinafter "Boguraev": US6353824).

Regarding **claim 6**, Horvitz in combination with Itti and Slatter teaches a method as recited in claim 1, wherein the corresponding attributes for each attention object of the attention objects comprise a minimal perceptible time (MPT) for display of subject matter associated with the attention object (Horvitz: column 17, lines 65-67 and column 18, lines 1-2).

Horvitz in combination with Itti and Slatter does not teach the further limitation of calculating the MPT as a function of: a number of words in the subject matter; whether the subject matter is for presentation to a viewer in a perusing image browsing mode or a skimming image browsing mode; user preferences; and/or, display context.

However, Boguraev discloses a method wherein calculating the MPT is a function of a number of words in the subject matter (column 20, lines 6-8, i.e. amount of information).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined Boguraev's method with the combined teaching of Horvitz, Itti and Slatter, the motivation to combine being to improve browsing efficiency (Boguraev: column 2, lines 30-42).

Regarding **claims 14, 27 and 39**, Horvitz in combination with Itti and Slatter teaches a method as recited in claim 1, discloses a computer-readable medium as recited in claim 16 and a computing device as recited in claim 28.

Horvitz in combination with Itti and Slatter does not teach the limitations further comprising: detecting user intervention during automatic playback of the browsing path; responsive to detecting the user intervention: recording all AOs S.sub.r of the AOs that have not been browsed; identifying all AOs S.sub.m of the AOs browsed during the user intervention; regenerating the browsing path based on S.sub.r-S.sub.m; and responsive to regenerating the browsing path and determining that there is at least a lull in user intervention, automatically navigating the browsing path.

However Boguraev discloses a method comprising: detecting user intervention during automatic playback of the browsing path (column 21 lines 3-7, i.e. zoom mechanism); responsive to detecting the user intervention: recording all AOs S.sub.r of the AOs that have not been browsed; identifying all AOs S.sub.m of the AOs browsed

during the user intervention; regenerating the browsing path based on S.sub.r-S.sub.m; and responsive to regenerating the browsing path and determining that there is at least a lull in user intervention (column 21, lines 41-44, i.e. screensaver mode), automatically navigating the browsing path (column 21, lines 34-37, i.e. default mode).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined Boguraev's method with the combined teaching of Horvitz, Itti and Slatter, the motivation to combine being to improve browsing efficiency (Boguraev: column 2, lines 30-42).

5. Claims 11, 22 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horvitz combined with Itti and Slatter as applied to claim 1 above, in view of Lee et al. (Hereinafter "Lee": Keansub Lee, Hyun Sung Chang, Seong Soo Chun, Hyungseok Choi and Sanghoon Sull, "Perception-Based Image Transcoding for Universal Multimedia Access", School of Electrical Engineering Korea University, Seoul, Korea, 2001 IEEE, pp. 475-478) and further in view of Boguraev.

Regarding **claim 11**, Horvitz in combination with Itti and Slatter teaches a method as recited in claim 1.

Horvitz in combination with Itti and Slatter does not teach the limitations wherein each AO is a respective information block and wherein the image (I) is a modeled as a set of M*N evenly distributed information blocks I_{ij} as follows:

$$I = \{I_{ij}\} = \{(AV_{ij}, r_{ij})\}, \quad 1 \le i \le M, 1 \le j \le N, r_{ij} \in (0,1),$$

wherein (i, j) corresponds to a location at which the information block I_{ij} is modeled according to a visual attention, AV_{ij} is a visual attention value of I_{ij}, r_{ij} is the spatial scale of I_{ij}, representing the minimal spatial resolution to keep I_{ij} perceptible; and, wherein generating the browsing path further comprises calculating an information fidelity (f_{RSVP}) for each AO, the information fidelity being calculated as follows for respective ones of the information blocks I_{ij}:

$$f_{RSVP}(I,T) = \int_0^T \sum_{I_{ij} \in I_{RSVP}(t)} AV_{ij}\, u(r(t) - r_{ij})\, dt, I_{RSVP}(t) \subseteq I;$$

and wherein $I_{RSVP}(t)$ is a subset of the information blocks and varies with time and

$$r(t) = \max_{I_{ij} \in I_{RSVP}(t)} r_{ij} \le \min\left(\frac{Width_{Screen}}{Width_{I_{RSVP}(t)}}, \frac{Height_{Screen}}{Height_{I_{RSVP}(t)}}\right),$$

which varies with space.

However, Lee discloses an equivalent method, excluding the time dependency (page 476, section 2.1, paragraph 2, section 2.2, and page 477, equations 2-4, i.e. visual attention value (AV) is importance value (s), and information value (f) is content value (V)).

Therefore it would have been obvious to combine Lee's teaching with the combined teaching of Horvitz, Itti and Slatter, the motivation to combine being to provide access to multimedia content from a wide variety of devices (Lee: page 475, first paragraph)

Lee does not disclose a time dependency for visual attention and spatial scale.

However, Boguraev discloses a method wherein visual attention and spatial scale are time dependent (column 20, lines 6-8, i.e. display time depends on information content, and column 21, lines 3-5, i.e. zoom)

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined Boguraev's method with the combined teaching of Horvitz, Itti, Slatter and Lee, the motivation to combine being to improve browsing efficiency (Boguraev: column 2, lines 30-42).

Regarding **claim 22**, Horvitz in combination with Itti, Slatter, Lee and Boguraev disclose a computer-readable medium as recited in claim 16, wherein each AO is a respective information block, and wherein the computer-program instructions further comprise instructions for implementing the method of claim 11 above.

Regarding **claim 34**, Horvitz in combination with Itti, Slatter, Lee and Boguraev disclose a computing device as recited in claim 28, wherein each AO is a respective information block, and wherein the computer-program instructions further comprise instructions for implementing the method of claim 11 above.

Response to Arguments

Summary of Applicants remarks: The limitation of panning the image according to browsing path is not found in the prior art of record. Pirolli does not teach information fidelity.

Examiner's Response: Applicant's arguments with respect to claims 1-4, 6-11, 14, 16-18, 20-30 and 32-40 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments, see pages 30-34, filed 1/18/2008, with respect to claim 12 have been fully considered and are persuasive. The rejection of claim 12 has been withdrawn. Applicant's arguments above also apply to claim 13 and new claim 41. The rejection of claim 13 has been withdrawn. Claim 41 is allowed.

Allowable Subject Matter

6. **Claims 12, 13, 23-26 and 35-38** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The recited equations are neither anticipated nor made obvious by the prior art of record.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLIFTON G. DALEY whose telephone number is 571-270-3144. The examiner can normally be reached on Monday - Friday 7:30am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on 571-272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Samir Ahmed
Examiner
Art Unit 2624

CGD
4/23/2008

/Samir A. Ahmed/
Supervisory Patent Examiner, Art Unit 2624